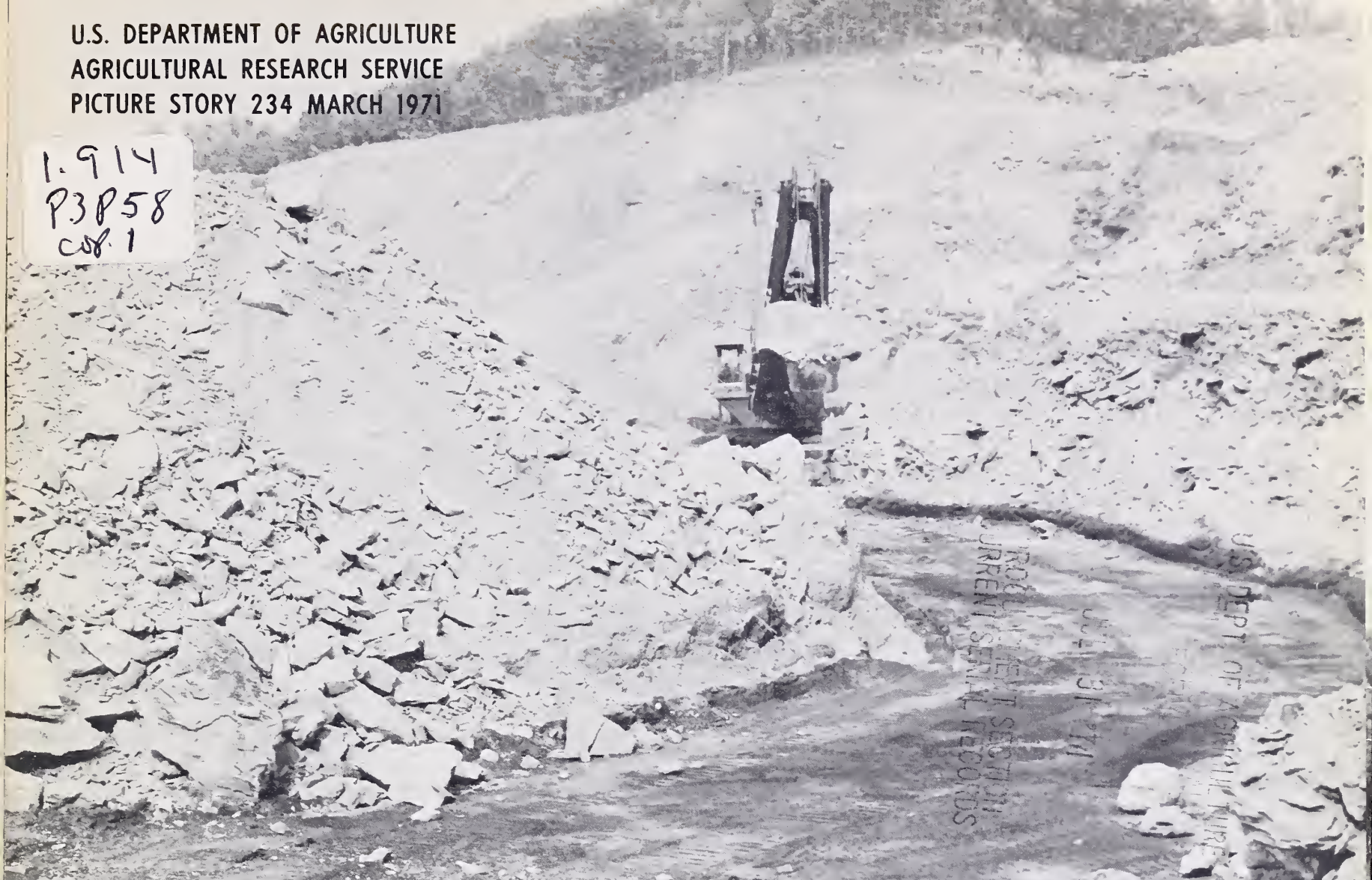


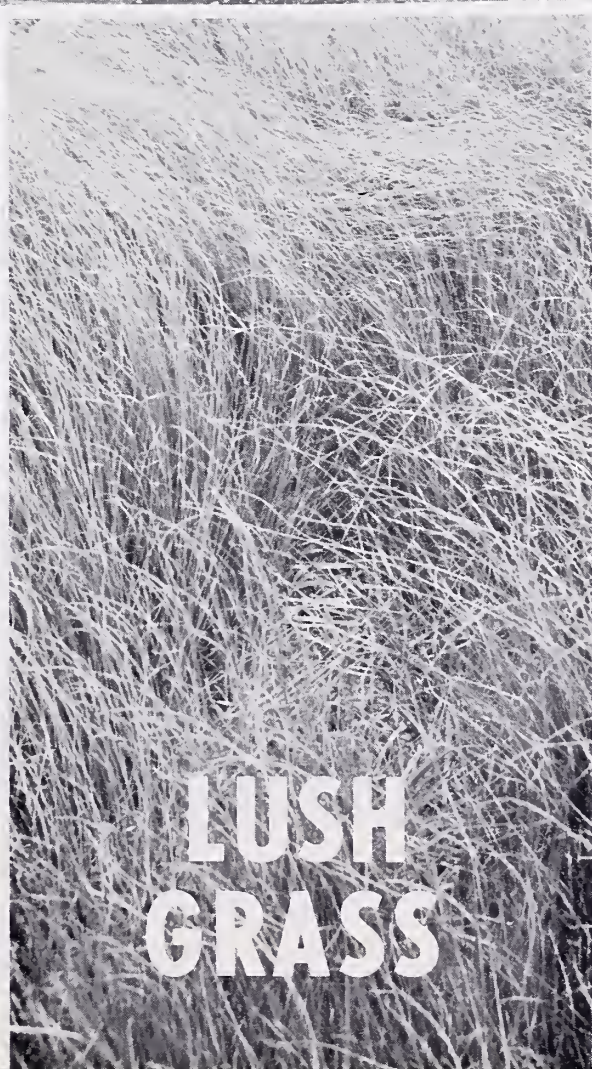
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AFTER THE COAL:



LUSH
GRASS



COVER: A West Virginia strip mining operation (1070X993-25) is contrasted with a lush crop of weeping lovegrass grown by USDA soil scientists on a strip mine spoil (1070X990-15).

WOUNDS IN THE EARTH, gouged by surface mining operations, bleed much like an open cut. The leaching and eroding of spoil banks from coal mining alone send more than two million tons of sulphuric acid plus millions of tons of sediment annually into the Nation's streams. A healing cover of vegetation is needed to halt this vast source of pollution.

Reclamation of the gashes left in the wake of the coal-digging machines has become the responsibility of the mine operator in most States. In West Virginia, for instance, an 80 percent coverage of legumes or perennial grasses must be established in two growing seasons after the mining permit has expired. If woody plants are used, 600 stems per acre must survive the two seasons.

Unfortunately, strip mine spoils make a hostile home for young plants. Soil scientists in the U.S. Department of Agriculture's Agricultural Research Service are working in both laboratory and field to find effective and economical ways of establishing vegetation in these areas--vegetation that will stabilize the banks, reduce runoff, beautify the spoil, and produce a forage or hay crop.

Acidity--common in strip mine spoils--is one major problem in reclamation. When soil is acid, various mineral ions are made available in quantities toxic to plants. The scientists are working with plants that have a high tolerance to this condition. They also are raising the pH of the soil through fertility management. Some tolerant plants raise the pH themselves in the vicinity of their roots.

Best results in several fertility treatments on test plots have come from the application of lime when the pH was below 3.5, and rock phosphate when the pH was about 4.0. All areas also got nitrogen and potassium treatment. Plants that fared best in trials were weeping lovegrass and tufcote bermudagrass.

Another problem in revegetation is finding an easy, cheap, and sure method of mulching. Without mulch the spoil material loses moisture fast near the surface, forming a crust the young plants can't get through. Researchers are experimenting with seedings of wheat and barley in the fall in hopes enough will survive the winter to serve as mulch for a permanent spring crop.

Studies of plant varieties and fertility management continue through the winter months in greenhouses using soils from the mining sites.



TOP: Lovegrass growing in containers filled with applications, are measured by a researcher in a Severely eroded strip mine terraces are shown or lovegrass harvested from a 4-foot-square section (1070X990-3).

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BELOW: Weeping lovegrass on a heavily-limed test plot in a West Virginia mine spoil is inspected. The highly-acid soil had an original pH of 2.8. The bare spots were seeded but not limed (1070X993-21).



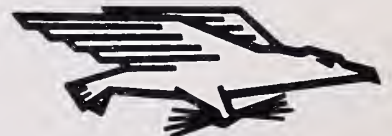
TOP: Lovegrass growing in containers filled with soils from strip mines which have received various fertilizer applications, are measured by a researcher in a Beltsville, Md., laboratory (1070A1012-30). BOTTOM LEFT: Severely eroded strip mine terraces are seen on Bolt Mountain, W. Va. (1070X991-2). RIGHT: The weight of lovegrass harvested from a 4-foot-square section of a test plot in a West Virginia strip mine spoil is recorded (1070X990-3).



A researcher fills glass-sided containers in a Beltsville, Md., laboratory with layers of soils taken from strip mines. Each layer gets a different fertilizer treatment. The glass sides will allow studies of root growth of plants in the containers as the roots pass through different layers (1070A1012-8).

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